# SCIENCE & GOVERNMENT REPORT

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## Fighting Dissent with R&D: Uncle Sam's Been at It

While press and Congressional investigations continue to reveal the extent to which the Johnson and Nixon administrations illegally unleashed the CIA, FBI, and other security agencies against American citizens, attention ought also be directed toward another facet of government-inspired activity during those paranoid regimes, namely: the enlistment of sizeable segments of the research community in projects aimed at predicting and defeating public protests.

Ranging in scope from pseudo-scholarship on the origins of urban disorder here and abroad to the development of Buck Rogers type devices for scattering crowds, these efforts – though nominally legal – reflect an anti-dissidence obsession that was wholly disproportionate to any threat confronting the public peace.

In bits and pieces, word of some of these projects leaked out during the past decade, but now thanks to the US Government's infatuation with data retrieval systems, they all, presumably, have been indexed in *Riots and Riot Control, A Bibliography with Abstracts, 1964-1974*, published by the National Technical Information Service, of the Department of Commerce. (110 pages, $25, NTIS/PS-75/003, NTIS, Department of Commerce, Springfield, Va. 22161.)

The volume claims to provide "110 selected abstracts of research reports (covering) riots, civil disturbances and disorders, insurgency in urban areas, the use of riot control agents, and equipment used to control riots. Both civilian and military riot situations are included." The figure, however, is unduly modest, since a fair number of the listed papers are themselves bibliographies of research on riots and riot control.

Picking at random from the titles and brief descriptions of the research projects, we find the following:

**Method and System for Personnel Control with Blinding Illumination**, for which the Army received a patent in May 1973. "The invention relates to a method and system for controlling unruly crowds of people by non-violent means, by using blinding illumination. The illumination includes a continuous low-intensity light together with a high-intensity flashing light to temporarily blind the human eye. Under these conditions, police equipped with optical filter means, e.g., goggles, which selectively cut out, and thereby protect their eyes against, the 'blinding' flashing light, can enter the crowd and remove individual agitators."

**Ballistically Operated Water Cannon**, researched under an Army contract by AAI Corporation, Baltimore. Dated June 1974, the abstract states: "A test program was conducted to determine and document the water pulse performance characteristics of the Portable Pumping System and the Ballistically-Actuated Water Cannon. Dynamic testing using a pendulum, physiological testing using animal targets, accuracy test against still and moving targets and impact type tests using targets which simulated human motive characteristics were conducted . . . (A)rea of impact, dangerous and innocuous effects to humans were determined and documented."

**Variable Velocity Projectice Launcher (Low Lethality)**, also conducted by AAI Corporation for the Army. The abstract, dated May 1974, reads: "The report summarizes design, fabrication, and testing efforts conducted in conjunction with the development of a man-portable, variable velocity projectile launch device. The device was configured to launch one-inch diameter rubber balls

*(continued on page 2)*

## In Brief

**With the Administration pressing hard for increased exports to the Soviet bloc, the Defense Department has asked the Defense Science Board to set up a task force on Export of US Technology: Implications to US Defense. The difficulty is that DoD itself has become a leading peddler of US technology. First meeting, in closed session, is scheduled for April 23 at the Pentagon.**

*The Air Force, looking for alternative fuel sources, is examining a number of possibilities, among them a revival of one of the greatest technological comedies of all time, the effort to build a nuclear-powered aircraft. That venture, which was terminated by the Kennedy Administration after expenditures of over $2 billion, is one of the options being studied by the Aeronautical Systems Division's Propulsion Laboratory. The Air Force estimates it could have a nuclear-powered craft aloft within 20 years.*

**The National Science Foundation will observe its 25th anniversary May 15th with a black tie dinner at the State Department, but in suitably frugal fashion for these difficult times, the Foundation's own treasury will not be involved. The stated cost of admission on the prettily engraved invitations is $20 per head.**

*The Federal Aviation Agency was going to lift its ban on inflight use of portable electronic calculators, but tests to determine the effect of the devices on navigation equipment have turned out to be "inconclusive and conflicting," according to the FAA, and the ban will remain in effect.*

# Riot Control (Continued): "Stabbing and Cutting Weapons"

(high-Q-spheres) at variable velocities designed to harrass, stun or extensively damage point and area personnel targets found in typical scenarios where less lethal weapons would be employed . . ."

**Portable Pumping Systems**, report, dated May 1974, of a project carried out by the Army Land Warfare Laboratory, Aberdeen Proving Ground, Md., concerning "A portable pumping system . . . developed for use by military units to control crowds in a civil disturbance situation . . . The water stream is effective for controlling/dispersing personnel at ranges up to 75-80 feet . . ."

**Riot Control Barrier Concept Development and Feasibility Test**, also conducted at the Land Warfare Laboratory. "A riot control barrier is needed to assist law enforcement personnel in holding back crowds during civil disturbances and riots," the abstract states. "Prototype riot control barriers were fabricated and feasibility-tested. The test results indicated that the corrugated steel panel riot control barrier is feasible and practical for the intended prupose, and that the concept is suitable for further development into troop use items."

**Nonlethal and Nondestructive Combat in Cities Overseas**, produced by the Institute for Defense Analyses in 1970 for the Defense Department's Advanced Research Projects Agency (ARPA). "The report examines nonlethal and nondestructive weapons – both present and potential – for their applicability to military operations in cities overseas [and, presumably, in the US.] . . . The potential nonlethal mechanisms that come under scrutiny include, among others: radiant heating, stabbing and cutting weapons, sound, wind vortices, animals, plants, manipulation of utilities, light, sticky materials, nets and snares, impact weapons, electrical weapons, and markers. Chemical agents are judged to be uniquely applicable to almost all urban operational missions. The paper concludes that there is a clear need to minimize destruction and fatalities in many of the overseas urban operations in which the United States may become involved."

**Concept Study for a Nonlethal Shoulder-Fired 40-mm. CS Grenade for Riot Control**, conducted by the Army's Edgewood Arsenal, as one of many studies of riot control gases and gas-delivery methods. The abstract, dated September 1971, reports a method that is intended to "eliminate any lethal hazard due to impact (of gas grenades) with an individual in the target area. This is achieved by deployment of a small parachute from the grenade during its flight resulting in the grenade impacting the target area at a low, nonlethal velocity."

In addition to these example of crowd-control weapons, the bibliography includes references to papers on benign means of control, among them the contribution of an apparently unwitting reinventor of Marxism, whose work, modestly titled, "A Breakthrough in Counterinsurgency," was produced in November 1973 at the Army War College, Carlisle Barracks, Pa. Described as a "student essay," this paper, which, but for the vacuum cleaner performance of the NTIS data retrieval system, would have disappeared forever, notes that "Land reform has been widely and successfully used as a means of defusing rural insurgencies in a number of underdeveloped countries. Demographic changes suggest that a major problem of the future will deal with the problems of urban poverty since urbanization is a significant trend throughout the earth . . . A method of capital reform which provides workers with a second income based on their ownership of the capital means of production is submitted as worthy of US governmental funding support. The idea, untried in practice, is visualized as analogous to land reform in the countryside."

Reprive from oblivion is also accorded another Army War College scholar, whose paper, Violence Control and the Selfish Urbanite, examines means of developing "popular support for police actions during periods of urban violence and how to achieve support. The forces of law and order, police or troops," he observes, "use various techniques to win this support but one powerful and basic trait of human nature is not sufficiently exploited. This trait is human selfishness or self-interest. The essay examines the

*(continued on page 3)*

As a companion to *Riots and Riot Control*, SGR recommends a collection of abstracts bearing the title, *Civil Insurgency*, which, though overlapping a bit with the former volume, is pitched toward a worldwide examination of civil disorder, 1964-74.

Thus, it contains a study of "police and police-type security organizations" in India, Thailand, Bolivia, and Guatamala.

There is an "analysis of 13 cases of local conflict in Latin America."

Another report deals with International Consequences of Domestic Violence: Cross National Assessment, and "presents the view that domestic violence tends to invite intervention if the ecological conditions are appropriate."

And, among many others, there is a study titled, "The Peruvian Military: A Summary Political Analysis," which, the abstract states, was undertaken "after the 1962 coup did not appear to conform to predominant expectations among US observers."

*Civil Insurgency*, 84 pages, NTIS/PS-75/002 is available for $25 from NTIS, Springfield, Va. 22161.

# Upgrading Sought for Manpower Studies

A subcommittee of the National Science Board (NSB) last week published a series of recommendations aimed at improving the doleful accuracy and usefulness of government forecasts of supply and demand for scientists and engineers.

Alongside those recommendations, however, the subcommittee also published an essay by NSB member William H. Meckling, Dean of the Graduate School of Management, University of Rochester, who argues that most so-called demand projections for scientists are essentially "useless," and that "the issue of whether, or to what extent, those predictions are 'accurate' is totally irrelevant from the standpoint of policies designed to improve the functioning of the market" for scientists.

Meckling argues that "statements to the effect that employers will demand some specific number in 1985 are essentially irrefutable and useless" because they don't take into account the effect of salary levels. "For any 'reasonable' number you choose as the projection," he states, "there will be some salary at which it would be true that employers would hire that number."

Moreover, contrary to oft-made claims in support of manpower projections, Meckling argues that they play little or no part in the process by which a student makes career choices. "In making career decisions," he states, "students are not directly concerned about how many persons will be employed in various occupations or professions. Those quantities themselves do not constitute attributes of occupations which enter into their preference ordering."

Be that as it may, the NSB subcommittee, which was chaired by Russell D. O'Neal of KMS Fusion, Inc., comes to the helpful conclusion that "manpower projections are currently in a state of flux" because forecasters are switching to more complicated market models. Though the switch may ultimately lead to more accurate projections which will include consideration of the effect of changes in salary levels, the models need more testing before the projections can be relied upon for decision-making, the subcommittee notes.

The subcommittee's conclusions are based on a seminar held last year, which was attended by most of the luminaries from the field of science manpower forecasting. Like Meckling, several participants at the seminar questioned the usefulness of previous projections of

*(continued on page 4)*

**RIOT CONTROL** *(continued from page 2)*

significance of this trait and possible circumstances under which it can be used."

At a more professional level, there is an ARPA project, carried out at Yale University in 1971, titled, "Political Protest and Power Transfers in Crisis Periods, Regional, Structural, and Environmental Comparisons. "The paper," states the abstract, "attempts to describe how political systems behave before, during, and after years of maximum political violence with respect to the pattern of protest and governmental change."

Another paper, out of the Rand Corporation in 1970, is titled, "The Occasional Tyrannies of Governing Majorities," and, according to the abstract, "comments on instances in which suppression of constitutional rights by civil authorities has been supported in view of existing conditions."

Finally, we can conclude with an abstract of a decade-old report that, in the midst of the current finale to the Vietnam debacle, provides a ghoulish epitaph for this country's strange alliance of coercion and scholarship.

Title: "Annual Army Human Factors Research and Development Conference (11th), held at the John F. Kennedy Center for Special Warfare, Fort Bragg, North Carolina, 3-6 October 1965."

Abstract: "Some reflections on social sciences support for stability operations – past and future; the army's role in preventing insurgencies; The present challenge – counter-insurgency operations; Toward defining an appropriate role for the military in stability operations ... The role of minority groups in counterinsurgency; Operational psychiatric research in the field in South Vietnam ... The role of crowds in civil disturbances; Prisoner behavior in simulated interrogations ... Development of a short, practical, programmed Vietnamese course...." –DSG

## *AF Funds New ID System*

As its contribution to the Barricaded Society, the Air Force is laying out $236,000 for development of an electronic system for verifying identity through computer analysis of signatures.

That sum has been awarded by the Electronics Systems Division, Hanscom (Mass.) Air Force Base, to Veripen, Inc., a subsidiary of Conversational System Corporation, N.Y., for research on a system that measures signature characteristics, including "pressure patterns," and stores the information in a computer. The system employs a special ball point pen that the signatory is required to use to match up with the stored sample of his or her writing The Air Force says the system will be useful for controlling entry to sensitive areas, but it obviously holds a promising potential for estension to credit card use, and all sorts of other situations in which personal identification is important.

# Internal ERDA Document Outlines New R&D Plan

The newly created Energy Research and Development Administration (ERDA) plans to reorient the basic physical science program that it inherited from the AEC toward greater industrial participation and an effort to involve the high-energy physics community in applied research projects. In addition, ERDA's plans call for an expansion of the materials sciences program "to include projects previously not funded" – specifically "energy-related materials research in solar, geothermal, coal and oil, automotive, conservation, and advanced power cycles."

These are some of the principal points contained in an "internal document," titled, "A Program of Basic Research in the Physical Sciences Under ERDA," which the Division of Physical Sciences recently sent to the House Science and Technology Committee. The document, addressed to Mike McCormack (D-Wash.), chairman of the Subcommittee on Energy Research, Development, and Demonstration, is described in a covering letter by Daniel R. Miller, acting director of the Physical Research Program, as an "internal document for which we have not sought official approval, although it may serve as the basis for developing a formal Division planning document in the future."

In response to an inquiry about the status of the document, which SGR obtained from sources apart from both ERDA and the Committee, an ERDA official said, "It represents the way we would like to go and the way we are guiding outselves."

Since ERDA is likely to balloon with money in coming years, the intention to cut industrial organizations into the old AEC physical research program is not likely to be at the expense of the established retainers, but it does mean that the rate of growth for these organizations will probably be less than some of them anticipated.

Thus, the report proposes that from a zero base under the AEC program, industrial organizations should share 5-7 per cent of the ERDA physical research budget by 1980. As "examples of organizations which could be candidates," it lists General Electric, DuPont, Esso Research Laboratories, Texas Instruments and Dow Chemical, "among many others."

For the established recipients, however, the proportional slices of the budget would drop slightly or remain constant, though, of course, a good deal more money will be going into the overall budget.

Under the heading of Multiprogram National Laboratories (Argonne, Brookhaven, Oak Ridge, Berkeley, Livermore, Pacific Northwest, and Los Alamos), the 1975 AEC allocation of 55 per cent would drop to a range of 50-54 per cent by 1980.

Specialized Physical Research Laboratories (Ames, Fermi, SLAC, Notre Dame Radiation Laboratory, MIT Bates Linac, and several others) would drop from 24 per cent at present to 20-22 per cent in 1980.

Universities that received more than $1 million a year from the AEC (Harvard, MIT, Washington, Carnegie-Mellon, Illinois, NYU, Pennsylvania, Rochester, Wisconsin, Yale, and Cal Tech) would go from 21 per cent to 20-22 per cent.

The report does not specify the dollar sums that are anitcipated for 1980, but it does state that "Essential changes are anticipated from the sort of physical research program which evolved under the AEC to that most appropriate for ERDA ... For example, whereas under AEC a major effort in radiation chemistry has been carried out for over two decades, relatively little work has been carried out in photochemistry. The latter sub-discipline

*(continued on page 5)*

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**MANPOWER** *(continued from page 3)*

scientific manpower. The subcommittee's report states, for example, that though "many people are potential users and currently obtain reports of projections ... it is far less clear that these projections have much influence on policy or decisions." Aside from the fact that the projections are little-used by students for making career choices, the report suggests that industry does not find them very useful for manpower planning because they are often not broken down into particular specialities.

For those reasons, the subcommittee suggests a number of steps by which the National Science Foundation, which is the focal point in the federal government for manpower forecasting, could improve the projections. In particular, the report suggests that more studies be undertaken to help determine in advance the manpower requirements of federal regulations and programs involving science and technology.

One sobering conclusion to emerge from the seminar, the subcommittee noted, is that "current projections based on analysis of census data suggest that for the next fifty years it is likely that there will be no growth in the size of the college-age population. As a consequence, anticipated levels of oversupply of doctorate-level faculty make employment opportunities in the academic labor market look more bleak for the period 1980 to the early 1990s than it has at any time in the past."

NSF will soon publish a major forecast of supply and demand for scientists and engineers between 1975 and 1985.

(Copies of the report, *Scientific and Technical Manpower Projections*, is available for $1.45 from the Government Printing Office, Washington, D.C. 20402.)

## *British Cut "Big-Science" Support, Military R&D*

For the second straight year, government support of research in Britain is likely to decline as part of an effort to get a grip on the country's roaring inflation. But, showing remarkable optimism in the face of dismal economic forecasts, government officials have predicted at least a modest recovery in funding for non-military research between 1976 and 1980.

The predications are contained in recently announced budget proposals for the research councils which, like the National Science Foundation, dispense money chiefly to the universities for basic research. The proposals entail an absolute decline in funding for the 1975-76 academic year of 1.3 per cent, following a drop of 2.1 per cent this year.

After 1976, however, the science budget is expected to grow at the rate of about 3.5 per cent a year – provided that the economy picks up and there are no further cuts in public expenditure, neither of which should be relied upon.

Within those forecasts, however, lies a significant policy decision on the part of Britain's research managers. The Science Research Council (SRC), which provides most of the money for 'big science' in Britain and for the country's share in international science activities, is not only slated to take the deepest cut this year, but it will also enjoy the slowest growth rate thereafter. According to the Advisory Board for the Research Councils, which divides the pie among the councils, the decision to squeeze SRC was taken because of "the need to reduce expenditures in the sciences that are extremely expensive per research worker in order to sustain growth in the other sciences supported by the SRC as well as the other councils."

Thus, the aim is to spread the available funds among as many researchers as possible and, in line with that policy, the social sciences are slated for the largest growth rate.

The forecasts were followed last month by a government proposal to slash more than $1 billion from previous estimates for military R&D over the next 10 years. If the cuts are made, they will amount to about 10 per cent of the projected military R&D budget.

Though the government has not spelled out where the defense cuts will be made, *New Scientist* quotes a government official as suggesting that long-term projects will be particularly vulnerable to the knife. The magazine takes that as an indication that military research in the universities may suffer disproportionately.

It is instructive to compare those predictions for research in Britain with events in the United States, where the social sciences are taking a clobbering and the Administration is proposing massive increases for military R&D.

## ERDA (Continued): Seeking Technology in High-Energy Physics

needs to receive much greater emphasis under ERDA because of its fundamental importance to utilization of solar energy.

"Similarly, new efforts need to be mounted concerning the properties and reactions of coal and concerning catalysis with emphasis on the class of reactions important to coal liquifaction and gasification. At the same time, there are many sub-disciplines of central importance to the utilization of nuclear energy which will also warrant high priorities, because they are also important in the utilization of other energy resources. Examples include the sub-disciplines of low-temperature physics (including studies of superconducting materials) and high-temperature materials sciences."

In connection with high-energy physics, another ERDA inheritence from the AEC, the report proposes a program of New Technological Initiatives designed "To initiate a concentrated development effort in new technologies aimed at projects which will draw heavily on the strong expertise in this area which exists in the high-energy physics program." The aim, it makes clear, would not be the furtherance of high-energy physics research . . .

"Areas where such potential exists," the report continues, "include superconductivity (wire, magnet design, fabrication techniques), cryogenics (refrigerators, cooling, large systems), digital encoding of graphical data (maps, charts), large-scale instrumentation, large-scale data handling, computer control of large system (power plant, utility networks), computer simulation, and accelerator technology."

As for financially depressed accelerator operations, the report offers no dollar amounts beyond the coming fiscal year, but the tone is generally optimistic. "The plan," it states, ". . . is to increase the utilization level of the accelerator facilities, within approved long-range budget projections, and to bring the major new capabilities at FERMILAB into operation. The plan is also to provide a level of capital equipment adequate for strong utilization of the available accelerator beam hours."

Perhaps the most optimistic note is contained in a table, titled Utilization Plan, for the four major accelerators supported by ERDA. Extending to Fiscal 1980, it shows utilization of the AGS at the Argonne National Laboratory rising from 60 per cent next year to 80 per cent in 1980. The AGS, it may be recalled, has been fingered for oblivion by the Office of Management and Budget.

# New Congressional Inquiries Slated on Atomic Energy

In a move which is symptomatic of the deteriorating political fortunes of the nuclear power industry, two separate Congressional committees have decided that nuclear energy is too important to be left solely to the Joint Committee on Atomic Energy (JCAE) and they are planning to conduct investigations of their own.

The new investigators are the Subcommittee on Energy and Environment of the House Interior Committee, headed by Presidential aspirant and environmental advocate Morris K. Udall (D-Ariz.), and the Joint Economic Committee, headed by Senator William Proxmire (D-Wisc.) Udall is promising an even handed and comprehensive "new national debate on the subject of nuclear energy," while Proxmire's committee will be probing into the reasons why the liquid metal fast breeder reactor (LMFBR) program is fast breaking all the records for cost overruns.

In a statement distributed recently, Udall noted that "within the past year the nuclear energy debate has become more polarized and the conflicting claims more extreme and strident. This situation ill serves the nation's urgent need for a balanced, far-reaching energy policy," he added. Nothing that "we must have a forum where all points of view are given a full and fair hearing," Udall suggested that his subcommittee should fit the bill very nicely.

The investigation will begin with hearings on April 28 and 29 and May 1 and 2, and Udall has promised to pursue the inquiry "now and throughout this congress."

To help orchestrate the committee's inquiry, Udall has appointed two new staff members, Brian O'Leary, a former scientist-astronaut and professor of Astronomy and Science Policy Assessment at Hampshire College, and Frank von Hippel, a physicist and longtime observer of science and government who recently co-authored a book on that topic *Advice and Dissent* (SGR Vol. IV, No. 22).

As for Proxmire's inquiry, he has long been threatening to take a close look at the reasons why costs of nuclear power plants have been escalating rapidly, and the mammoth overruns on the fast breeder program – estimates for which have mushroomed from less than $3 billion to more than $10 billion in four years – has provided him with an ideal excuse. Although no firm date had been fixed, a committee aide said last week that the Joint Economic Committee is trying to rearrange its business to schedule hearings later this month on the LMFBR program.

A few years ago it would have been unthinkable for other committees to move in on the territory of the JCAE, but recent reorganizations in the House have blurred committee jurisdictions, and membership changes on the JCAE have left that committee considerably weakened. The committee reorganization approved by the House last year assigned "special oversight" on nuclear energy to both the Interior and the Science and Technology Committees (SGR Vol., IV, No. 18), and it is that authority which Udall is using as the basis for his inquiry.

But, aside from the obvious political advantages from getting into the nuclear debate, Udall's move is also a

*(continued on page 7)*

## DoD Restudying Scale of Military Health University

With its Congressional angel, F. Edward Hebert (D-La.), deposed from the chairmanship of the House Armed Services Committee, the grandiose scheme for a vast complex of health training schools for the military services is being reexamined at the direction of the Defense Department, which is the paymaster for the multi-hundred-million-dollar venture (SGR Vol. V, No. 3).

So far, all signs are favorable for proceeding with plans to build the medical school which is to be centerpiece of what is known as the Uniformed Services University of the Health Sciences, and the Administration has approved a $72-million budget request for this purpose in the coming fiscal year.

But the Department of Defense, with Hebert off its back, is having second thoughts about the various other schools – pharmacy, veterinary medicine, nursing, and so forth – that were to be included in the University. And it has directed the University's planners to put a freeze on these segments while the matter is studied further.

The University, for which ground has been broken on the campus of the National Naval Medical Center, Bethesda, Md., was a 20-year-long dream of Hebert, but got no place until he ascended to the chairmanship of Armed Services in 1971. Approval then came swiftly, despite widespread misgivings about the costs that would be involved in creating a school whose output of 100 physicians a year would do virtually nothing toward easing the armed services' physician shortage, which is expected to be about 2000 a year at the end of this decade.

Because of certification delays, the start of the first class has been posponed from September to December, but otherwise, the medical school is proceeding along its original schedule.

# Atomic (Continued): Plutonium Ban Gains Support

response to growing unease on Capitol Hill over the role of nuclear power in the long-term energy picture, a role which Congress itself will soon be called upon to decide.

An indication of the extent of that unease is the fact that a bill sponsored recently by Rep. Les Aspin (D-Wisc.), designed to prevent the use of plutonium as a fuel in light water reactors, had picked up 48 co-sponsors by last week. And a similar bill introduced in the Senate contains among its sponsors two members of the JCAE – Clifford Case (R-NJ) and John Tunney (D-Calif.).

Though support for the bill was considerably strengthened by a series of revelations, contained in five press releases from Aspin's office in the space of three weeks, that plutonium for reactor fuel was being flown into Kennedy Airport, the extent of the support has surprised most observers.

The use of plutonium to fuel light water reactors is an important step in the nuclear industry's plans to stretch out uranium supplies, but even more important for the long-range nuclear program is the LMFBR, and Congress is now facing some crucial funding decisions for that program.

Although the health hazards and safeguards problems associated with plutonium have so far been at the heart of the debate about plutonium recycle and the LMFBR, the cost overruns on the LMFBR program are likely to prove the most tempting target in the Congressional debate on the program. Cost overruns are much easier to understand than esoteric health and safety issues, and though ERDA – which now has responsibility for the LMFBR program – can provide a wealth of reasons why the program is soaking up so much money, a cost overrun of $7 billion on a program orginially estimated at $3 billion is not easy to explain away.

For those reasons, the JCAE itself has recently established an *ad hoc* subcommittee to take a close look at the LMFBR program. According to an announcement last month by JCAE Chairman John O. Pastore (D-RI), the review will include public hearings, and it will cover all aspects of the program. Rep. Mike McCormack (D-Wash.) has been named chairman of the subcommittee.

That move has been seen by LMFBR critics as simply an attempt to head off attacks on the program, however, because for one thing, the review will not be completed until after Congress has dealt with the FY 1976 budget request for the LMFBR, and for another, McCormack is a former AEC employee and has been an articulate supporter of nuclear power. It should be noted, however, that McCormack is a shrewd and effective legislator who is well aware of the need for a dispassionate inquiry into the LMFBR program. He has pledged to conduct an open review of the matter.

One close observer of Congressional maneuverings on energy policy acknowledge to SGR that there has recently been an increase in the "noise level" of complaints about nuclear power, but he noted that there have so far been no votes which would indicate the full extent of anti-nuclear sentiments. –CN

## In Print

*Science and the Challenges Ahead*, annual report of the National Science Board of the National Science Foundation; a predictable pitch for increased federal support for science, particularly basic research, but more candid than this genre usually is in stressing both the utility and limitations of science. (56 pages, 85 cents, Stock No. 038-000-00205, US Government Printing Office, Washington, D.C. 20402).

*Proceedings of the Workshop on Solar Energy and the Law*, report of an NSF-supported conference held by the American Bar Foundation on legal issues related to solar energy, including zoning, building codes, taxes, and FHA assistance. (26 pages, available without charge, American Bar Foundation, 1155 East 60th St., Chicago, Ill. 60637).

*Federal Funds for Research, Development, and other Scientific Activities*, Fiscal Years 1973-75; NSF's latest compilation of the numbers. (65 pages, $1.70, Stock No. 038-000-00206, US Government Printing Office, Washington, D.C. 20402).

*The Elements*, deep-digging monthly newsletter on energy and resources, published under the auspices of the Institute for Policy Studies, a leftish "think tank" that is taken seriously in Washington political circles. (Annual subscriptions: $5 for individuals, $10 for institutions. *The Elements*, 1901 Q St. NW., Washington, D.C. 20009).

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# GAO Questions Fast Breeder Safety Features

The latest report by the General Accounting Office (GAO) on the liquid metal fast breeder reactor (LMFBR) program provides further evidence of a growing dispute within the federal government over the safety design of the first LMFBR demonstration plant, which will be built on the Clinch River in Tennessee.

In a report published last December, GAO noted that the regulatory branch of the Atomic Energy Commission was then suggesting that the Clinch River plant should be fitted with a device known as a core-catcher, which, in the unlikely event of a meltdown, would intercept the reactor core and spread out the fissile material to prevent a chain reaction from taking place (SGR Vol. V, No. 1). Now, in a report released last week, GAO hints that the utilities may seek to pull out of an agreement under which they are putting up a share of the costs of the plant, if the government insists on having a core-catcher incorporated into the design.

The report (RED-75-361, $1, available from the GAO, Washington, D.C. 20548) states that the Nuclear Regulatory Commission (NRC) believes that a core meltdown "although unlikely, is within the realm of possibility and should be provided for in the design" of the Clinch River plant, and that ERDA has started work on an alternate design which includes a core catcher. IF NRC eventually rules that such a design is necessary it would increase the costs of building LMFBRs, but the GAO report states that ERDA officials believe that "it would not necessarily render the LMFBR concept uneconomical."

Nevertheless, when ERDA asked Congress last month to amend the management agreement for the Clinch River plant to provide for total government control over the project rather than joint government-industry management (SGR Vol. V, No. 6), it also asked to have a clause inserted in the cost-sharing agreement which would allow the utilities to pull out if they could not agree to major design changes. "There are very strong indications that the utility participants are opposed to including a core catcher in the (Clinch River plant) design," the GAO report states.

Since one of the chief objectives of the Clinch River plant is to prove that the LMFBR design is marketable, participation by the utilities – which will be the ultimate buyers of LMEBRs – in the project is considered to be particularly important. GAO therefore notes that if such a get-out clause is incorporated into the agreement, it would "place tremendous pressure" on NRC when it reaches its decision on the necessity for core-catchers.

The need for a core-catcher has been challenged on the grounds that liquid sodium is such an effective coolant that a core meltown is so remote a possibility as to be incredible. And an ERDA official concerned with the LMFBR project suggested last week that the issue could lead to "a continuing, never-ending series of regulatory arguments" over the possibility that a core-catcher would not be able to contain a molten reactor core in any case.

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